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EDWARDS AIR FORCE BASE • ENVIRONMENTAL MANAGEMENT DIVISION

Report to STAKEHOLDERS

http://www.edwards.af.mil/penvmng/index.html

INSIDE

In this issue . . .

STILL GOING — A dual extraction system at Site 18.

Dual extraction system measures up in BIG fuel cleanup challenges

The following article begins a new series in Report to Stakeholders that will run throughout the year. "We've tried it ... It works!" is the basis for this series. The series highlights cleanup technologies that have been tested and have shown promise at Edwards Air Force Base (AFB).

To date, dual extraction systems have been responsible for cleaning up the largest portion of contaminant removed at Edwards AFB — about 1.3 million of the approximately 1.5 million pounds of contaminant removed has been treated by dual extraction systems. Think of it as one of cleanup technologies' big guns. It is generally reserved for use at those cleanup sites where the challenge is comparatively huge, like a contamination hot spot, so where it succeeds, it succeeds BIG!

Dual extraction systems are capable of removing contamination from both groundwater and soil at the same time, or the system can be operated to treat one or the other. These systems work well at removing large masses of contamination, particularly hydrocarbons; which at Edwards AFB includes things like trichloroethene (TCE) — a solvent — and jet fuel.

See *Dual Extraction* page 7

If you have a question about the Edwards Air Force Base Environmental Management program, you may address it to Stakeholders Forum, Attn: Gary Hatch or Miriam Harmon, 5 E. Popson Ave., Edwards AFB, CA 93524-8060, or send e-mail to: afftc.em.com.rel@edwards.af.mil

Next RAB Meeting

February 2005
Rosamond
Wanda Kirk Library

The public is invited.

Q. Lately I've noticed headings such as "Conservation" and "Environmental Quality" in the pages of *Report to Stakeholders*. What is the significance of these headings?

A. In the past, *Report to Stakeholders* covered only the cleanup, or Environmental Restoration Program, at Edwards AFB. The cleanup program began in 1990 when Edwards AFB was placed on the National Priorities List and became, in effect, a Superfund law site. Publication of *Report to Stakeholders* began as part of the communication effort mandated under this law.

With the maturity of the cleanup program, it became possible late last year to make a slight change in editorial direction so that coverage in *Report to Stakeholders* was expanded to include all three branches of the Environmental Management (EM) Division at Edwards AFB, not just the Restoration Branch. The new headings "Conservation" and "Environmental Quality" refer to two branches of EM that have been operating alongside the Restoration Branch in EM all along, but the activities of these branches were publicized elsewhere, in the on-base newspaper *Desert Wings*, for instance. The change in coverage by *Report to Stakeholders* provides readers with a wider and more complete view of environmental activities taking place on the base.

EM offers a full range of environmental expertise and services involving everything from compliance with air quality standards and hazardous waste management to management of cultural and natural resources on the base.

Organizationally, EM is comprised of three branches. The Conservation Branch has responsibility for the Environmental Impact and Analysis Process, Cultural Resources Management Program and Natural Resources Management Program. The Environmental Quality Branch manages air quality, water quality, hazardous waste, aboveground and underground storage tanks, the basewide pollution prevention (P2) program, weapons system P2, solid waste management, recycling, hazardous materials management, and special programs (PCBs, asbestos, and lead-based paint). The Restoration Branch, as you know, manages the cleanup of the base.

The new headings are meant to cue readers that a section or article of *Report to Stakeholders* relates to one of these branches. ■

Report to Stakeholders is a publication of the Edwards AFB Environmental Management Division. Its purpose is to inform and educate the public, base workers and residents about continuing Environmental Management efforts at Edwards AFB. It currently has a circulation of 6,000, including about 2,000 subscribers.

Contents of the *Report to Stakeholders* are not necessarily the official view of, or endorsed by, the U.S. government, the Department of Defense, or the Department of the Air Force.

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Report to **STAKEHOLDERS**

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Base Civil Engineer..... James Judkins
Division Chief Environmental Management..... Robert Wood
Branch Chief Environmental Restoration..... David Steckel
Branch Chief Environmental Conservation..... Gerald Callahan
Branch Chief Environmental Quality..... Robert Shirley

Lakebeds come alive

With winter rains tiny shrimp eggs spring to life

Tiny shrimp eggs spring to life by the millions when rain falls on Rogers and Rosamond Dry Lakes. For thousands of years these tiny freshwater shrimp have been living in the dry lakebeds at Edwards AFB.

Biologists have identified five different species of freshwater shrimp on base; the clam shrimp, tadpole shrimp, and three different types of fairy shrimp. Although many freshwater shrimp are threatened or endangered around the world, the species found at Edwards AFB are fairly common.

Freshwater shrimp aren't the same as those found in your local supermarket or restaurant. Instead, they are much smaller in size and range from one-half to four inches long, depending on the species. The largest of the species is a fairy shrimp, growing to four inches, while the other shrimp grow to be no longer than an inch.

Thousands of years ago, the area that is now Edwards AFB was primarily underwater. When the water dried up, the shrimp became isolated in what are now dry lakebeds and clay pans. These freshwater shrimp adapted to the desert environment by laying their eggs, or cysts, just below the soil surface. When the lakes and clay pans dry out, the eggs remain for the next season of rain.

The eggs are durable and able to withstand both drought and extreme heat and can stay dormant for 25 years or more. If there are favorable rains in the winter and early spring (January-April), the shrimp hatch and begin their life cycle — which from egg to adult takes only a few weeks.

Located along a major migratory bird route, Edwards AFB is an important stop for birds. Migrating birds will rest and eat on their way south for the winter and upon their return in the spring. Without the shrimp as a food source, many of these birds would have a difficult time making the migration.

In order to help preserve the shrimp populations on base, take note that vehicle traffic on the lakebeds and clay pans is restricted. If you are authorized onto these areas, do not drive across them, especially when they are wet. This can cause deep ruts that may take years or decades to fill.

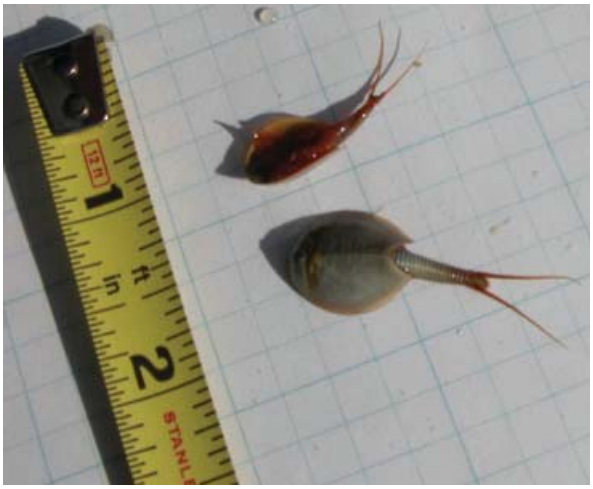
When the lakebeds are dry, vehicle impact can compact the soil, damaging or destroying the freshwater shrimp eggs and the cyanobacteria (algae that helps bind the soil). As a result, the soil becomes unstable, increasing soil erosion. Several dry lakes in Southern California have been damaged from recreational activities.

Branch Memorial Park is an accessible area to see freshwater shrimp on base. The park is located west of Lancaster Boulevard near the southern boundary of Edwards AFB. With adequate early winter rains, freshwater shrimp can also be found within the clay pans. To collect the shrimp for temporary observation, make sure you bring the following equipment: boots, a strainer (to strain the shrimp from the water), and a container for observation.

Some shrimp species are found only in certain areas or clay pans on base, so please place the shrimp back in the same area you found them. Take the time to observe and enjoy the diversity of life here on base, and remember to do your part to ensure Edwards AFB continues to have healthy lakebeds and clay pans for the next generation.

Two types of shrimp that can be found in the lakebeds are:

Fairy shrimp



Tadpole shrimp

MEETING TIME — New Edwards AFB Housing RAB representative, Amy Bouchard, left, and South Base RAB representative Michael Gillette — at his last RAB meeting — take a break after the presentation on Antelope Valley basins and subbasins that was given by Earth Tech's Todd Battey.

Amy Bouchard is the newest RAB member representing the Base Housing community

An ad in the Edwards AFB weekly newspaper caught the newest RAB member Amy Bouchard's eye. The ad was an announcement to fill the vacancy for the Base Housing representative.

Her predecessor, B. Susan Davis left with her husband, former 412th Test Wing Commander, Col. Charles Davis to Arlington, Va., where he is the deputy program executive officer for the Joint Strike Fighter Program Office.

The ad sparked Amy's interest in the RAB so much so that she quickly applied to be the new Base Housing representative in the middle of last year.

"I like to know what is going on with the environment," Amy said, "I have four children, and I want to know that everything around me is safe, especially for my children and other children."

Amy sees this opportunity to be a public representative as a way to inform and to educate others about the cleanup happening at Edwards AFB.

"All you see is what is shown on the television or in movies, like *Erin Brockovich*," Amy said. "Being a part of the RAB is not only a great way for me to learn about what is going on with the cleanup process, but it is also a way for me to inform the community I represent. Most people think it's all bad because of what they see, when it's not."

Amy's inquisitive mind stems from her father, who was a journalist and editor for 40 years at the Lorain *Morning Journal* in Ohio. He is currently a professor of journalism at John Carroll University, also located in Ohio.

After high school, Amy took on a two-year commercial arts program and excelled with a 4.0 in her first year. "I enjoyed all of my classes tremendously," Amy added.

Throughout her work career, Amy has made a point of serving the public. In addition, to once being a licensed cosmetologist, Amy served four years as an active duty member in the Air Force and five years as part of the Montana National Guard.

A majority of her stint in the Air Force was with Services where she was involved with accounting, food services, even working in a mortuary.

Little did she know her services commitment would be expressed yet again as a RAB representative. November 2004 marked her first RAB meeting at the Mojave Veterans Building.

"It's important for communities to be aware and educated about the cleanup processes on base," Amy said. "They need to know what is going on around them, what is in the ground and why, so that they don't think anything is being kept from them.

It's important to know all sides of the arena."

Amy took advantage of the opportunity to expand her knowledge with the base cleanup process through a training academy the ERP gives for RAB members. The training took place last summer.

"The training I was able to receive at the academy was thoroughly informing for someone like me," Amy said.

"It's a great program, and I wouldn't mind seeing it done every year. It was beneficial for me to learn where all the cleanup sites at Edwards AFB are, what is being cleaned up, and how it is being cleaned up."

When it comes to environmental cleanup, the questions that pop into Amy's mind are most likely questions that would pop into anyone's mind that hasn't been exposed or become aware or educated about how the ERP works on base; some may not even know there is such a program.

The newest addition to the RAB wants to make her community aware. She wants to know the basics, such as: what effects, if any, will there be on the community while the cleanup process is being completed? How long will a cleanup process take to complete? Are we using the most cost effective and efficient way to clean up?

Amy and her husband, Capt. Noel Bouchard – a Test Pilot School Major select – have been stationed at Edwards AFB with their four children since May 2004. Prior to that, they were at Dyess AFB, which is located in Abilene, Texas.

In her spare time, Amy enjoys quilting, sewing, reading, cooking, baking, painting, doing any types of crafts, and outdoor activities like camping, hiking, and skiing.

If you have any questions regarding the cleanup process or any concerns, consult with your RAB representative and they'll be sure to relay the question or questions to ERP engineers.

RAB representatives are listed by location on the last page of this newsletter. ■

"Being a part of the RAB is not only a great way for me to learn about what is going on with the cleanup process, but it is also a way for me to inform the community I represent."

Amy Bouchard
Base Housing Representative
Restoration Advisory Board

RAB Meeting Highlights

Earth Tech Geologist Todd Battey

The following reports highlight the latest quarterly meeting of the RAB, held Nov. 18, 2004 at Mojave, Calif.

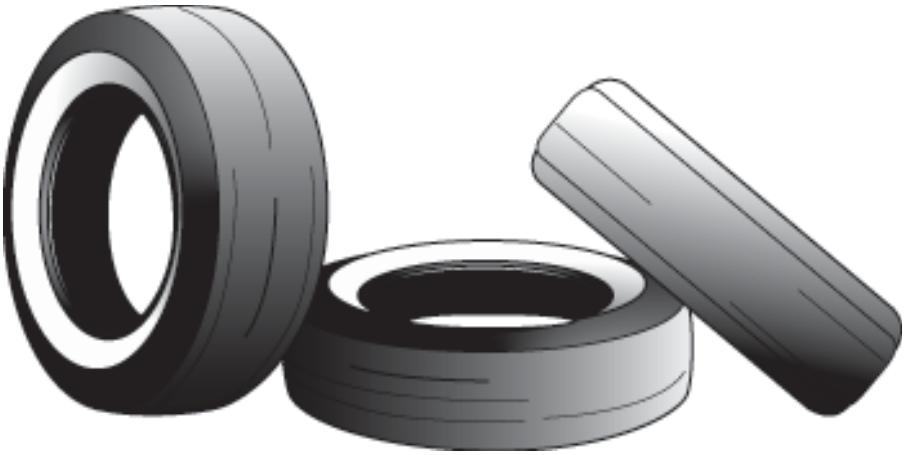
Antelope Valley Groundwater Basins and Subbasins — Restoration Branch Chief David Steckel introduced Earth Tech Geologist Todd Battey at the November meeting in Mojave to give a presentation to RAB members on the Antelope Valley Groundwater Basins and Subbasins. Battey explained the potential issue of storing and recovering water necessary to supply the rapidly expanding communities of the Antelope Valley. He also went over the areas that would be best for storing imported water, which is needed to keep up with the growing population in the Antelope Valley.

The next meeting of the RAB will be held in February 2005 at the Rosamond Wanda Kirk Library, the date and location are to be announced. The public is invited to attend.

Tire retreading program **$aves** Edwards money

Replacing tires for a fleet of about 350 trucks to handle the big jobs of refueling an aircraft, fighting fires or grading and sweeping roadways can come with a high price tag. But for the past seven years, Edwards AFB has successfully reduced such costs — by as much as $15,000 annually — through a tire retreading program that adds up to 1,200 hours of life to a used tire without reducing safety.

For most fleets, tires represent the third largest item in their operating budget, right after labor and fuel costs. Fleet managers have found they can reduce their tire costs by at least 50 percent through a retread of casings at least twice.



At Edwards AFB, about 40 to 50 tires a month are retreaded by Civil Engineer (CE) Transportation. CE Transportation contracts for retreading services with High Desert Ground Engaging Tools (GET), a local tire company in Lancaster, Calif. The program serves refueling trucks used by air ground equipment (AGE) and all CE vehicles including fire trucks, tow tractors, loaders, graders and road sweepers.

Cost savings for retreading versus new tires are significant, particularly for the trucks and haulers that spend hours on the road. Refueling trucks that haul up to 6,000 gallons of fuel and weigh 70,000 pounds use from 15 to 20 tires a month in the retreading program. These tires are expected to last 300 hours per tire and there are 24 tires on the vehicle.

Fire trucks use tires that are 5 feet high and 2 feet wide. New, these tires can cost up to $3,000 each and are replaced about once a year. Tires on lighter trucks are replaced every one to two years after about 1,200 hours on the road.

Tires can be retreaded up to three times. In most situations, retread tires can be driven under the same conditions and at the same speeds as new tires with no loss in safety or comfort. In fact, retread tires have been safely used on school buses, trucks, cars, fire engines, and other emergency vehicles for years.

Retreading tires also helps conserve a valuable nonrenewable resource — oil. Every year, retreading saves more than 400 million gallons of oil in the United States. Tires are basically petro-chemical products. It takes 22 gallons of oil to manufacture one new truck tire. Most of the oil is found in the casing, which is reused in the retread process. As a result, it takes only seven gallons of oil to produce a retread truck tire. Retread tires help divert thousands of scrap tires from disposal each year.

To ensure the safety of retread tires on trucks at Edwards AFB, tires are X-rayed by High Desert GET after the retreading process and before the tires are delivered to be installed.

Flaws are detected and repaired before they cause problems. Their state of the art inspection finds hidden separations and small punctures that often cannot be found by visual inspection.

After recapping, tires are expected to last from 600 to 800 hours. CE maintains a one-month inventory of recapped tires. Retreading of tires, typically, is done by the vendor on a one-week turnaround.

Retreading of tires at Edwards AFB complies with the "Greening of the Government" federal affirmative procurement plan which covers cost-saving and environmentally friendly efforts related to oil and tires. In addition, the program incorporates the U.S. EPA's recommendations for procurement of tire retreading services which includes competition between vendors of new tires and vendors of retread tires.

To make it easier to buy recycled tires, the EPA updates the Comprehensive Procurement Guidelines (CPG) every two years. Through the CPG, EPA designates items that must contain recycled materials when purchased by federal, state and local agencies, or by government contractors using appropriated federal funds. EPA's research shows that the items designated in the CPG are safe, of high quality, widely available, and cost competitive with untouched products. ■

DUAL EXTRACTION

FROM page 1

Dual extraction is an above-ground treatment method. A number of extraction wells must be dug to bring contaminated water and vapor from the soil to the surface for treatment. These systems are designed to operate 24 hours, seven days a week.

The groundwater treatment portion of the system is also referred to as pump-and-treat. The dual extraction water treatment system consists of an oil/water separator, a low-profile air stripper, and a liquid phase granular activated carbon system. Once treated, the groundwater — which can be extracted at rates of up to 100 gallons per minute — is discharged into the sanitary sewer, while treated vapors are vented into the atmosphere.

Pump-and-treat for groundwater is companioned with a soil-vapor extraction (SVE) unit. These units are equipped with an extraction blower, catalytic oxidizer with heat exchanger, and a scrubber. Vapor is processed through SVEs at up to 2,000 standard cubic feet per minute.

"At Edwards AFB, where dual extraction has been used since 1996, this technology has been more successful with fuels than solvents," said Tara Macharg, an engineer who oversees the operation of dual extraction technologies at the base for environmental contractor Earth Tech, Inc.

"At Site 45, a former gas station on base, dual extraction was successful in cleaning up 30,000 pounds of petroleum free product to below cleanup goals so that the site could be closed," she said. "Once the dual extraction system had done its work it was moved to other sites where cleanup was needed. When it's moved again this spring, it will have served at four cleanup sites. The ability to reuse these systems is one of the technology's chief benefits," she added.

At Site 16, where a dual extraction system was installed in January 1997, it has so far removed 1,871 pounds of hydrocarbons in liquid form and 277,545 pounds of hydrocarbons in vapor form.

Dual extraction was first used at Edwards AFB at Site 16 on the Main Base flightline. This site is located near a former Army aviation maintenance hangar. The site was contaminated with fuels and solvents that were released in a spill at the jet engine maintenance facility on Wolf Avenue, just northwest of Hangar 1810.

After installation of the dual extraction system, it began operation with four dual extraction wells online. In July and August 1999, an additional 14 dual extraction wells were added and brought online. Two more followed in August 2002, bringing the total current expanded system to 20 dual extraction wells. In August 2003, the 21st dual extraction well was installed but was not placed online because of the lack of funds. It is expected to be online this year.

The installation of dual extraction well 21 will be added to treat the TCE-contaminated soil and groundwater located on the eastern side of the dual extraction system treatment plant area where existing shallow extraction wells have gone dry. Eight vapor extraction wells will also be added to the system.

In 1997 the cleanup method used became a concern when the dual extraction system was possibly creating dioxins through the burning of solvents. Dioxins are a group of 210 chemicals linked to birth defects and cancer, and are byproducts of the incomplete burning of chlorinated solvents.

The system took air-powered groundwater pumps and vacuum extraction to remove contaminants like jet fuel and solvents from the soil. The following year, the technology showed lower dioxin results. It was noted by David Steckel, then a program manager for the ERP, in a 1998 RAB meeting that the problem occurring with the equipment during its first round of sampling may have been the source of water for the scrubber — a piece of equipment that removes acid, which is a byproduct of the combustion process, for the air coming out of the stack.

In November 1998, following further sampling for dioxins, the U.S. Environmental Protection Agency gave the ERP a go-ahead to restart the system.

Currently, the system has a groundwater flow capacity of 50 gallons per minute (gpm) and a vapor flow rate capacity of 1,000 standard cubic feet. With the addition of the new wells the groundwater flow rate will be 55 gpm, and 1,400 standard cubic feet per minute.

Other cleanup sites where dual extraction systems have been used include Sites 5, 11, 14, 17, 18, 19, 20, 24, 37, 45, 46, 49, 51, 58, 66, 133, 172, and 223. In each case, contamination involved either solvents or fuels. At some sites only groundwater treatment was required, at others only soil-vapor extraction. These systems operated for several years in some cases, but in others they were used only for a brief time. In all cases, dual extraction systems have been successful at removing relatively large masses of contamination.

But dual extraction, an *ex situ* technology, has never provided a complete answer to cleanup at Edwards AFB.

"Since the mid to late 90's, there has been a significant advancement in *in situ* (or *in-place*) technologies nationwide," said Paul Schiff, ERP program manager. "But a major constraint on utilizing these *in situ* technologies here at Edwards is our very flat, slow-moving groundwater."

Dual extraction is good at removing large contaminant masses in high concentration in groundwater, but doesn't do well at getting at contamination that is receding out into the capillary fringe of the water table.

"At Site 16, for instance, the dual extraction system was expanded to capture a larger area of the plume. The initial system focused on the highest concentrations of the plume. However, the concentrations have been receding, so it is necessary to go out further to capture the larger extent, but less concentrated plume," Schiff said. ■

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Published data and documents relating to the Environmental Restoration Program are available for public review in information repositories at four locations. The current information repositories are located in the cities of Boron, Lancaster and Rosamond, as well as Edwards AFB. They are updated when new documents are released.

If you have any questions about information in the repositories, please contact Gary Hatch, Environmental Public Affairs at (661) 277-1454 or through e-mail at gary.hatch@edwards.af.mil.

Location	Days and Hours of Operation	
Edwards AFB Library 5 W. Yeager Blvd. Building 6225 Edwards AFB, Calif. (661) 275-2665	Mon-Thurs Fri. Sat & Sun	9:30 a.m. - 7 p.m. 9:30 a.m. - 6 p.m. 10:30 a.m. - 6 p.m.
Kern County Public Library Wanda Kirk Branch 3611 Rosamond Blvd. Rosamond, Calif. (661) 256-3236	Tue & Wed Thu-Sat	Noon - 8 p.m. 10 a.m. - 6 p.m.
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Col. Vernon P. Saxon, Jr. Aerospace Museum 26962 Twenty Mule Team Road Boron, Calif. (760) 762-6600	Mon-Sun	10 a.m. - 4 p.m.

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